

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Yoo, et al.

Serial No.: 10/023,125

Confirmation No.: Unknown

Filed:

December 17, 2001

For:

Pulse Nucleation Enhanced Nucleation Technique for Improved Step Coverage and Better Gap Fill for

WCVD Process

Group Art Unit: Unknown

Examiner:

Unknown

Assistant Commissioner for Patents Washington, D.C. 20231

Dear Sir:

CERTIFICATE OF MAILING 37 CFR 1.8

I hereby certify that this correspondence is being deposited on 2, 2002 with the United States Postal Service as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231.

Signature

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

The Applicants, and the Attorney who signs below on the basis of the information supplied by the inventor and the information in his file, submit herewith patents, publications, or other information of which they are aware, which may be material to the examination of this application and in respect of which there may be a duty to disclose in accordance with 37 CFR § 1.56.

While the information submitted in this Supplemental Information Disclosure Statement may be material pursuant to 37 CFR § 1.56, it is not intended to constitute an admission that any patent, publication, or other information referred to therein is prior art for this invention unless specifically designated as such.

In accordance with 37 CFR § 1.97, this Supplemental Information Disclosure Statement is not to be construed as a representation that a search has been made or that no other possibly material information as defined under 37 CFR § 1.56(a) exists. 05/08/2002 BARRAHAI 00000008 200782 10023125

01 FC:126 180.00 CH The patents and/or publications submitted herewith are set forth on the attached Form PTO-1449.

If the sum of \$180.00 is due under 37 CFR § 1.17(p) pursuant to § 1.97, the Commissioner is hereby authorized to charge this fee, and any other fee necessary to make this submission timely, to the Deposit Account No. 20-0782/APPM/5730/BTP.

Respectfully submitted,

Keith M. Tackett

Registration No. 32,008

MOSER, PATTERSON & SHERIDAN, L.L.P.

3040 Post Oak Blvd., Suite 1500

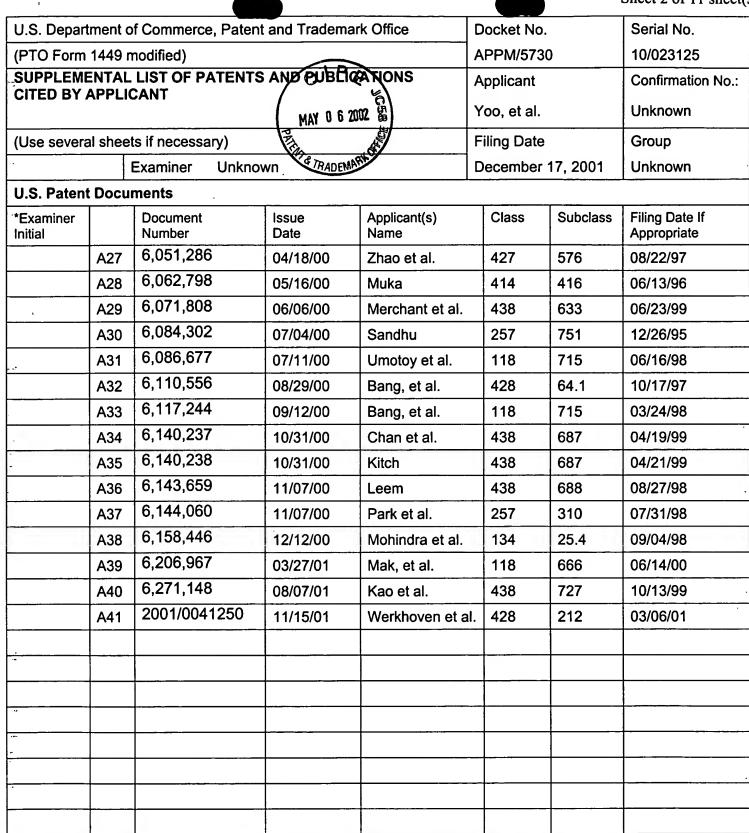
Houston, TX 77056

Telephone: (713) 623-4844 Facsimile: (713) 623-4846 Attorney for Applicant(s)



U.S. Depar	tment o	of Commerce, Pate	rk Office	Docket No.		Serial No.	
(PTO Form	1449 n	nodified)			APPM/5730	ס	10/023,125
SUPPLEM CITED BY		LIST OF PATENT	SNOILE	Applicant		Confirmation No.:	
			MM 0 6 3	ar (%)	Yoo, et al.		Unknown
(Use sever	al shee	ts if necessary)	MAI O	J)	Filing Date		Group
		Examiner Unkn	own TRADEN	MARKO	December	17, 2001	Unknown
U.S. Paten	t Docu	ments					
*Examiner Initial		Document Number	Issue Date	Applicant(s) Name	Class	Subclass	Filing Date If Appropriate
	A1	4,813,846	03/21/89	Helms	414	744.1	04/29/87
	A2	4,917,556	04/17/90	Stark et al.	414	217	05/26/89
	A3	4,951,601	08/28/90	Maydan, et al.	118	719	06/23/89
	A4	5,000,113	03/19/91	Wang et al.	118	723	12/19/86
	A5	5,028,565	07/02/1991	Chang, et al.	437	192	08/25/1989
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	A7	5,186,718	02/16/93	Tepman et al.	29	25.01	04/15/91
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	A9	5,234,561	08/10/93	Randhawa et al	. 204	192.38	08/25/88
	A10	5,259,881	11/09/93	Edwards, et al.	118	719	05/17/91
-	A11	5,286,296	02/15/94	Sato et al.	118	719	01/09/92
	A12	5,580,380	12/03/1996	Liu, et al.	117	86	01/30/1995
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	A17	5,730,801	03/24/98	Tepman et al.	118	719	08/23/94
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	A19	5,788,799	08/04/98	Steger, et al.	156	345	06/11/96
	A20	5,801,634	09/01/98	Young et al.	340	635	09/08/97
	A21	5,856,219	01/05/99	Naito et al.	438	241	08/18/97
·-	A22	5,866,213	02/02/99	Foster et al.	427	573	07/19/97
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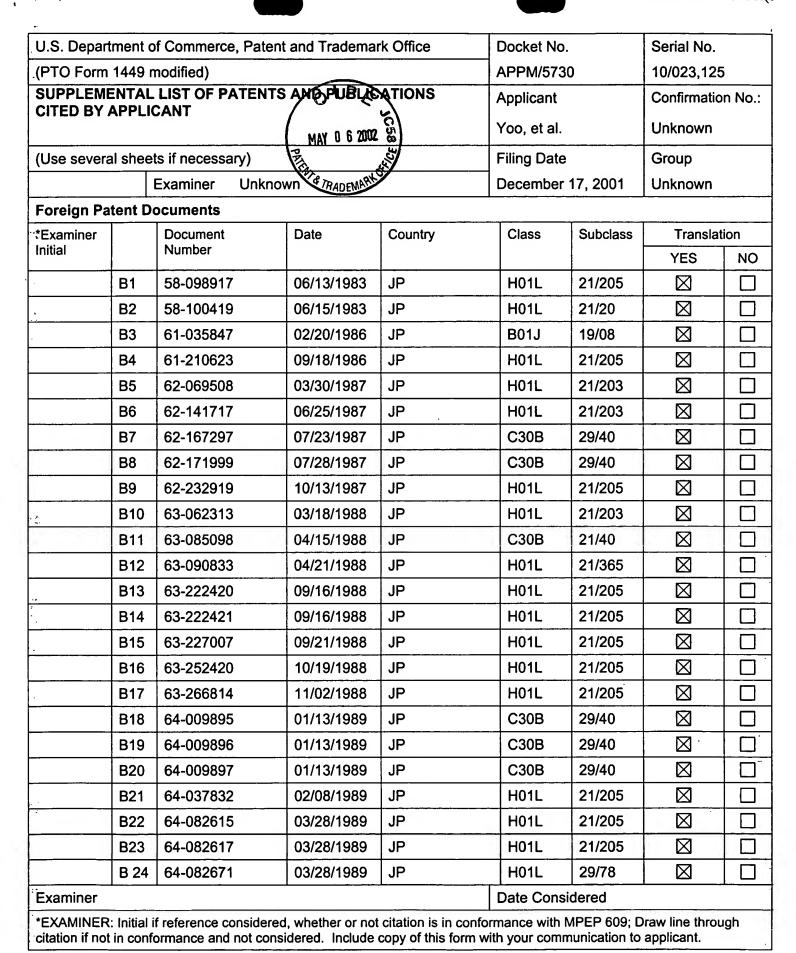
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant.



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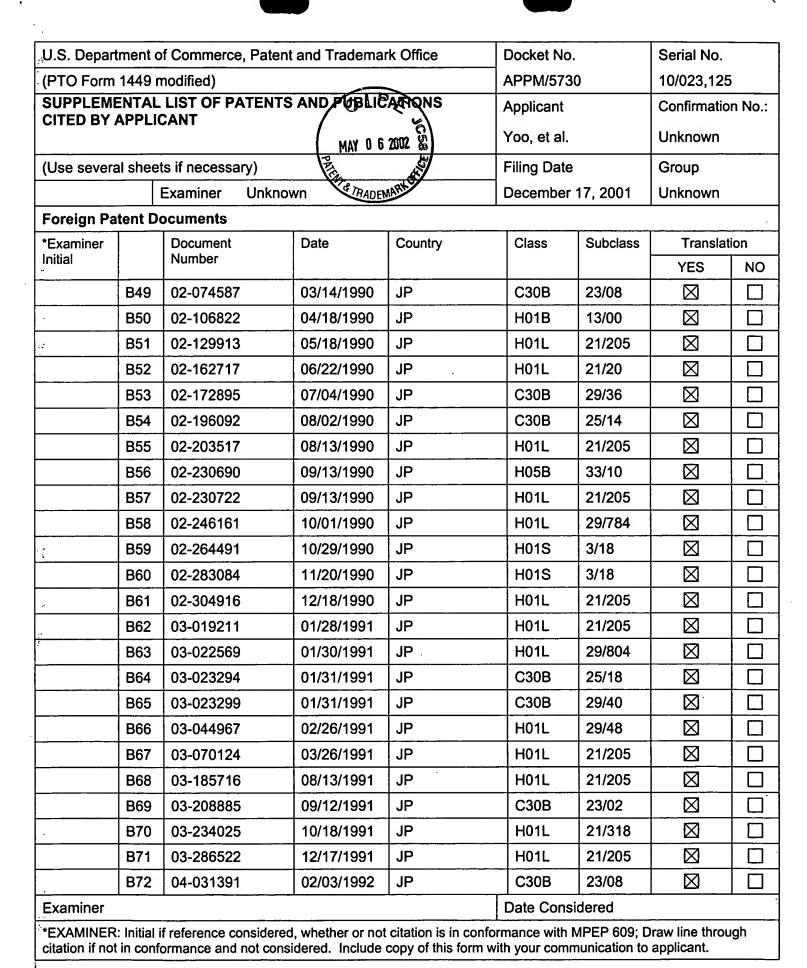
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CITED BY APPLICANT MAY 0 6 2002				Yoo, et al.		Unknown		
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Foreign Pa	atent Do	ocuments						
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(PTO Form		•			APPM/573	30	10/023,125 Confirmation No.:	
SUPPLEM	ENTAL	LIST OF PATEN	ITS AND PUBLIC	ATIONS	Applicant			
CITED BY APPLICANT					Yoo, et al.		Unknown	
(Use sever	al shee	ts if necessary)	12) 6 2002 E	Filing Date)	Group	
		Examiner Unk	nown	and the second	December	17, 2001	Unknown	
Foreign Pa	atent D	ocuments	MAI	JEWIE WILL	_			
*Examiner		Document	Date	Country	Class	Subclass	Translat	ion
Initial		Number					YES	NO
	B73	04-031396	02/03/1992	JP	C30B	25/14		
	B74	04-100292	04/02/1992	JP	H01S	3/18		
	B75	04-111418	04/13/1992	JP	H01L	21/205		
	B76	04-132214	05/06/1992	JP	H01L	21/205	\boxtimes	
	B77	04-132681	05/061992	JP	C30B	25/14	\boxtimes	
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<u> </u>	B91	05-047666	02/26/1993	JP	H01L	21/205	\boxtimes	
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SUPPLEM	ENTAL L	IST OF PATENT	S AND PUBLIC	ATIONS	Applicant	-	Confirmation No.:		
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Initial		Number					YES	NO	
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,	B99	05-182906	07/23/1993	JP	H01L	21/20			
	B100	05-186295	07/27/1993	JP	C30B	25/02	\boxtimes		
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	B106	05-283336	10/29/1993	JP	H01L	21/20	\boxtimes		
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	B108	05-304334	11/16/1993	JP	H01L	3/18	\boxtimes		
	B109	05-343327	12/24/1993	JP	H01L	21/205	\boxtimes		
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-	B112	06-132236	05/13/1994	JP	H01L	21/205	\boxtimes		
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	B114	06-196809	07/15/1994	JP	H01S	3/18			
-	B115	06-222388	08/12/1994	JP	G02F	1/136	\boxtimes		
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	B117	06-230421	08/19/1994	JP	G02F	1/136	\boxtimes		
	B118	06-252057	09/09/1994	JP	H01L	21/205	\boxtimes		
	B119	07-070752	03/14/1995	JP	C23C	16/40	\boxtimes		
	B120	07-086269	03/13/1995	JP	H01L	21/314			
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		Commerce, Pater	rand Tradema	тк Опісе	Docket No.		Serial No.	
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SUPPLEM			Applicant		Confirmatio	n No.		
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Foreign Pa	tent Doc	uments		RADEMAN				
*Examiner		Document	Date	Country	Class	Subclass	Translat	ion
Initial		Number					YES	NC
	B121	07-086269	03/13/1995	JP	H01L	21/314	\boxtimes	
	B122	08-181076	07/12/1996	JP	H01L	21/205	\boxtimes	
	B123	08-245291	09/24/1996	JP	C30B	25/14	\boxtimes	
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	B140	2001-020075	01/23/2001	JP	C23C	16/44	\boxtimes	
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SUPPLEMENTAL LIST OF PATENTS AND PUBLICATIONS CITED BY APPLICANT					Applicant		Confirmation No.	
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Ittiliai		Number					YES	N
	B147	2001-240972	09/04/2001	JP	C23C	16/458		
	B148	2001-254181	09/18/2001	JP	C23C	16/46		Σ
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	B150	2001-303251	10/31/2001	JP	C23C	16/44		Σ
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	B157	90/02216	03/08/1990	wo	C23C	14/34		
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CITED BY	APPLIC	(MAY 0 6 2002 2)	Yoo, et al.	Unknown			
(Use severa	al sheet	s if necessary)	Filing Date	Group			
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	C1	Ohba, et al., "Thermal Decomposition of Methylhy TiN Thin Films", Conference Proceedings, Advan- 1993 (1994), pp. 143-149					
	C2	Scheper, et al.,"Low-temperature deposition of tital based precursors", Materials Science in Semicono					
	C3	Suzuki, et al., "A 0.2-µm contact filing by 450°C-h resistivity", IEDM 92-979, pp. 11.8.1 – 11.8.3	ydrazine-reduced TiN fili	m with low			
,	C4	Suzuki, et al., "LPCVD-TiN Using Hydrazine and TiCl ₄ ", VMIC Conference (June 8-9, 1993) pp. 418-423					
	C5	IBM Tech. Disc. Bull. "Knowledge-Based Dynamic Control, (June 1990), pp. 80-84	IBM Tech. Disc. Bull. "Knowledge-Based Dynamic Scheduler in Distributed Computer Control, (June 1990), pp. 80-84				
	C6	IBM Tech. Disc. Bull. "Multiprocessor and Multitas Advanced via Inspection Tools" (May 1992), pp. 1	_	ol Control of the			
	C7	McGeachin, S., "Synthesis and properties of some acetylacetone, and their metal complexes", Canad pp.1903-1912					
	C8	Solanki, et al., "Atomic Layer deposition of Coppe State Letters, 3(10) (2000), pp. 479-480	r Seed Layers", Electroo	hemical and Solid			
	C9	NERAC.COM Retro Search: Atomic Layer Depos	ition of Copper, dated O	ctober 11, 2001			
	C10	NERAC.COM Retro Search: Atomic Layer Depos dated October 2, 2001	ition / Epitaxy Aluminum	Oxide Plasma,			
	C11	NERAC Search abstract of "Atomic Layer deposit Barriers", by Rossnagel, et al., J. Vac. Sci. & Tech		connect Diffusion			
	C12	Abstracts of articles re atomic layer deposition					
	C13	Abstracts of search results re atomic layer deposi	tion, search dated Janua	ary 24, 2002			
	C14	Abstracts of articles re atomic layer deposition an	d atomic layer nucleation	າ			
	C15	Abstracts of articles re atomic layer deposition an	d semiconductors and co	opper			
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	C16	Abstracts of articles – atomic layer deposition			
	C17	NERAC Search – Atomic Layer Deposition, sea	rch dated October 16, 200	01	
	C18	Bader, et al., "Integrated Processing Equipment 33, No. 5 (May 1, 1990), pp. 149-154	", Solid State Technology	, Cowan Pub., Vol.	
7	C19	Choi, et al., "The effect of annealing on resistivity of low pressure chemical vapor deposi titanium diboride", J. Appl. Phys. 69(11) (June 1, 1991), pp. 7853-7861			
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	C24	Lee, et al., "Pulsed nucleation for ultra-high aspelinc. (2001), pp. 1-2 (COPY NOT AVAILABLE TO			
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Examiner			Date Considered		

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant.